

REMARKS

In U.S. Patent Application No. 09/890,115 (hereinafter “parent application”), of which the instant application claims priority, claims 8, 9, 17 and 18 were rejected under 35 U.S.C. 103(a) over German patent publication DE4438870 (hereinafter ‘870). Independent claims 8 and 17 have been amended herein to better distinguish over the ‘870 reference. Thus, for the following reasons, claims 8 and 17, and their respective dependent claims 9 and 18, are now patentable over ‘870.

With regard to claims 8 and 17, the ‘870 reference does not teach or suggest “a heating element which is formed of a carbon-based substance including *a resistance value adjustment substance*,” as required. Rather, the heating element disclosed in ‘870 comprises a carbon fiber ribbon element, wherein the carbon fiber is formed of a pure carbon substance. Thus, the pure carbon fibers of ‘870 do not satisfy the “resistance value adjustment substance” limitation of claims 8 and 17.

Further, the heating element of ‘870 is limited in that its heating value cannot be set to an arbitrary value. Pure carbon must be used in order to produce carbon fibers being sufficiently thin to produce the desired fast response capability. The use of pure carbon thereby limits the heating value. Additionally, the fibers of ‘870 are formed by a cutting process, resulting in the presence of varying strains within a fiber that cause variation in the heating values. These variations may result in overheating of the element and/or melting of the fiber.

In the present invention as claimed, the heating value of heating element can be set to an arbitrary value by varying the amount of resistance value adjustment substance added to the carbon-based substance. Further, since the plate shaped heating element is formed by

sintering the two substances together, the resulting substance is less prone to the variations in strain present in the heating element of '870.

For all of the reasons stated above, the present invention can be distinguished from the '870 reference. Particularly, since every limitation of the claims is not taught or suggested, namely the "resistance value adjustment substance" is not taught by '870, claims 8 and 17, and their dependent claims are patentable over the prior art of record.

In the parent application, claims 11, 12, 25 and 26 were rejected under 35 U.S.C. 103(a) over the '870 reference in view of Japanese patent publication JP64-65790 (hereinafter '790). For the following reasons the claims are patentable over the prior art of record.

Regarding claims 11 and 12, which depend from claim 8, the '870 reference does not teach or suggest every limitation of the claims for the reasons explained above with regard to claim 8. Further, the '790 reference does not teach or suggest the deficiencies of the '870 reference. Thus, claims 11 and 12 are patentable over the prior art of record.

Regarding claims 25 and 26, and further regarding claims 11 and 12, Applicant submits that no motivation or suggestion exists in the prior art that would lead one of ordinary skill in the art to combine the '870 reference and the '790 references to arrive at the claimed invention. Specifically, the '870 reference does not teach or suggest providing "a reflection film for reflecting infrared rays." Therefore, the Examiner has cited the '790 reference for teaching this limitation. However, in order to sustain a rejection under 35 U.S.C. 103(a) and establish a *prima facie* case of obviousness, there must be some suggestion or motivation in the prior art to make the proposed combination. There mere fact that making the combination would produce a useful or desirable result does not replace an actual suggestion or motivation in the prior art.

Claims 11, 12, 25 and 26 each require both a flat, plate-shaped heating element and a

reflection film. As explained on pages 10-12 of the present application, prior art infrared ray lamps that have semi-cylindrical reflectors, such as is disclosed in the '790 reference, also have cylindrical heating elements (as opposed to the plate-shaped element of the claimed invention) which produce isotropic infrared ray emission, such that the heating rays are emitted uniformly in all axial directions of the element. The purpose of the reflector is to restrict the emission of infrared rays from the lamp to a specific direction. However, since the rays are emitted in all directions by the isotropic element, the use of the reflector results in certain disadvantages, including heat loss and other inefficiencies (as explained in detail on page 12 of the present application). Further, since the element is isotropic, the semi-cylindrical reflector of the '790 reference does not prevent the waves from being over a large range of directions, i.e. 180 degrees.

Flat or plate-shaped heating elements, as claimed, emitted infrared rays in substantially only two directions. As disclosed in the present application, providing a reflector on a lamp having such a "bidirectional" plate-shaped element results in a more efficient directional emission of heat. Moreover, since the plate-shaped element emits infrared rays only in two directions, very precise directional control can be provided by selectively positioning the reflector. Applicant submits that neither these advantages nor any other reasons are disclosed in the prior art of record, including the '870 and '790 references, which suggest modifying the infrared radiator of the '870 reference, which has a flat resistance heater, to include the reflective film of the '790 reference, as required by the claims. Thus, it is submitted that a *prima facie* case of obviousness has not been established for the purpose of sustaining a rejection under 35 U.S.C. 103(a). Therefore, claims 11, 12, 25 and 26 are patentable over the prior art of record.

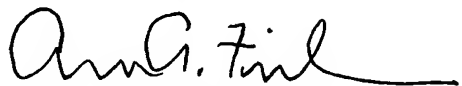
Claims 13-16 and 19-24 were rejected under 35 U.S.C. 103(a) over various

combinations of the '870 reference, the '790 reference, U.S. Patent No. 3,127,112 to McCammon et al., UK patent publication GB2133259, U.S. Patent No. 6,041,164 to Hofius, Sr. et al., and U.S. Patent No. 5,628,859 to Janin et al. Since claims 13-16 depend from claim 11 and claims 19-24 contain substantially the same limitations discussed above, the arguments provided above also apply to claims 13-16 and 19-24. Further, none of the references cited in rejecting claims 13-16 and 19-24 disclose the deficiencies of '870 and '790 explained above with regard to claim 11. Specifically, nothing in the cited references provides a motivation or suggestion to combine the teachings of '870 and '790 to arrive at the claimed invention. Thus, claims 13-16 and 19-24 are patentable over the prior art of record.

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Date: July 8, 2003